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Environmental Modeling of Storm Water Channels

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Abstract : Turbulent flow in complex geometries receives considerable attention due to its importance in many engineering applications. It has been the subject of interest for many researchers. Some of these interests include the design of storm water channels. The design of these channels requires testing through physical models. The main practical limitation of physical models is the so called “scale effect”, that is, the fact that in many cases only primary physical mechanisms can be correctly represented, while secondary mechanisms are often distorted. These observations form the basis of our study, which centered on problems associated with the design of storm water channels near the Dead Sea, in Israel. To help reach a final design decision we used different physical models. Our research showed good coincidence with the results of laboratory tests and theoretical calculations, and allowed us to study different effects of fluid flow in an open channel. We determined that problems of this nature cannot be solved only by means of theoretical calculation and computer simulation. This study demonstrates the use of physical models to help resolve very complicated problems of fluid flow through baffles and similar structures. The study applies these models and observations to different construction and multiphase water flows, among them, those that include sand and stone particles, a significant attempt to bring to the testing laboratory a closer association with reality.

Keywords : open channel, physical modeling, baffles, turbulent flow
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